

NEW SPECIES OF *BANASA* FROM THE CARIBBEAN AREA AND COMMENTS ON THE STATUS OF *SCHRADERI* SAILER (HEMIPTERA: PENTATOMIDÆ)

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This paper, like my earlier one on *Banasa* (Sailer, 1957), provides technical names for use by Franz and Salley Hughes-Schrader of Columbia University, in reporting the results of their cytological investigations on this genus. After my 1957 paper was published, they submitted new material containing four more undescribed species as well as additional specimens of *panamensis* Sailer and *schraderi* Sailer. Upon studying the additional specimens of *schraderi*, I found that the population to which this name is applied must be reduced to the rank of a subspecies. Reasons for the change are discussed below.

The names for the four new species described in this paper were made available to the Schraders and used in their paper (Schrader and Schrader, 1958). There may be some question regarding validation of the names in that publication. A decision on this point depends upon how Article 25c of the Code of Zoological Nomenclature is interpreted. Article 25c reads:

"But no generic or specific name, published after December 31, 1930 shall have any status of availability (hence also validity) under the Rules, unless and until it is published either (1) with a summary of characters which differentiate or distinguish the genus or the species from other genera or species." (2) or with definite bibliographic reference . . . [etc.]."

The information contained in the Schraders' paper could be used to distinguish between the species treated in their paper. However, such identifications could be made only by experienced cytologists applying the complicated and highly refined techniques used by the Schraders. Their paper was not concerned with systematics but with the comparative cytology and biochemistry of the reproductive cells of the different species and with interpreting differences in light of their evolutionary implications. It is scarcely conceivable that their technique could be used routinely in systematic studies and therefore it is my opinion that the information published by the Schraders fails to fulfill the requirements of Arti-

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cle 25c and does not validate the names for the purpose of systematic zoology.

If a rigid interpretation requires that the names be credited to the Schraders, it will still be important that the species be described in conventional terms and related to the existing scheme of classification. In this event the present paper will serve to fix the type specimens and clearly establish the identity of the species that were studied cytologically by the Schraders.

Banasa bidens subsp. *schraderi* Sailer, *NEW STATUS*

Banasa schraderi Sailer, 1957, Bul. Brooklyn Ent. Soc. 52: 85-86.

When *schraderi* was described, two characters seemed to distinguish the type series from specimens identified as *bidens* Van Duzee. First, *schraderi* had fewer and smaller punctures on the dorsal surface, the head and particularly the juga being nearly smooth; second, there appeared to be significant differences in the male genitalia. Four of the five specimens available for study were collected at Turrialba, Costa Rica, by Dr. Schrader; the fifth had been taken many years earlier from the same locality. Not long after the description of *schraderi* appeared, Dr. Schrader sent additional specimens for identification. These came from Barro Colorado Island, Canal Zone, Panama, and closely resembled *schraderi*. However, their parameres were similar to those of *bidens*. Since the genital structures published with the description of *schraderi* were drawn from a single paratype, I dissected as many additional specimens as possible, including the holotype of *schraderi*, to learn whether the characters of the male genitalia were stable and to what extent the differences could be related to differences in dorsal punctation.

To my great surprise the genitalic structures of the holotype of *schraderi* proved to be different from those of the paratype and were similar to those of the males from Barro Colorado Island. For comparison these structures are illustrated in figures 1 and 5. Specimens similar to the holotype in punctation and genital structure now include examples from Turrialba, Costa Rica; Barro Colorado Island, and Paraiso in the Canal Zone of Panama; and Meta Villavicencio, Colombia. Since they can all be distinguished from the typical *bidens*, so far known only from Trinidad, *schraderi* may be retained as a subspecies. There remains the possibility that *bidens* will prove to a synonym of either *varians* Stål, 1872, or of the still older name *subrufescens* Walker, 1867.

The paratype specimen illustrated in the description of *schraderi* was the one listed under the F. Schrader number, CR 49F25.

It and another paratype listed as from the Schild-Burgdorf collection belong to an unnamed species closely related to the species described below as *zeteki*.

***Banasa zeteki*, n. sp.**

Except for the more densely punctured dorsal surface, this species resembles *schraderi* Sailer very closely. The more numerous dark punctures cause it to appear darker in color. No females are available for study, but the male characters indicate that *zeteki* probably belongs to the *subrufescens* species group.

Color and surface sculpture.—Head and pronotum back to a line between the humeral angles stramineous, tinted with pale green and pink. Remainder of pronotum and most of scutellum olivaceous. Tip of scutellum smooth, nearly white. Head with tylus, a spot adjacent to each eye and two parallel bands on frons smooth, remainder of head with scattered punctures. Fuscous punctures form an impressed row along anterior margin of pronotum, are scattered irregularly on anterior lobe and are almost absent on line between humeral angles. Remainder of pronotum, scutellum except the tip, and each corium more numerous and regularly punctate. Veins of membrane darkened and in one specimen the color fuses to form two dark spots in basal area. Propleuron with scattered dark punctures, mesopleuron smooth with dark spot on anterior margin; metapleuron with 3 or 4 dark punctures laterally beyond the evaporative area and more numerous small punctures on posterior lateral area. Venter smooth, stramineous, acute posterolateral angles of each segment and adjacent areas in anterolateral angles black. Tergum dark, almost black, connexiva stramineous to green.

Antenna with 3 basal segments green or yellowish, 4th green at base, apical three-fourths infuscated, 5th pale with broad fuscous band around middle. Apex of rostrum and apical half of each claw black, legs otherwise pale.

Structure.—Ovate, pronotum and basal two-thirds of scutellum convex in lateral view. Head with juga sinuate before the eyes and regularly rounded to apex of tylus. Rostrum barely extending beyond the hind coxae, ratio of segments as 4:5:5:4. Ratio of antennal segments as 2:3:5:6:6. Venter of abdomen with basal spine tuberculate, barely reaching apices of hind coxae. Male paramere as shown by figure 2.

Length, including membrane: Male, 9.5 mm.¹

¹ Measurements are taken from holotype and allotype specimens.

None of the species described in this paper show significant size variation among the few specimens contained in the type series.

Width across humeral angles: Male, 5.1 mm.

Type material.—Holotype: ♂, Barro Colorado Island, C. Z., Panama, May 23, 1957, F. Schrader, No. A69; U. S. National Museum cat. no. 64405. Paratypes: ♂, same data, collected May 24, 1957, No. A79. 1 ♂, same locality, March, 1944, J. Zetek. 1 ♂, Paraiso, C. Z., Panama, Jan. 27, 1911.

This species is named in honor of James Zetek who directed the Barro Colorado Laboratory for many years and added immeasurably to our knowledge of the natural history of the Island.

Banasa centralis, n. sp.

Superficially similar to *subrufescens* (Walker), 1867. However, the structure of the female's genitalia is quite different from that of the species belonging to the *subrufescens* group (compare figs. 8 and 10). Among the described species the external male genitalia of *centralis* are most like those of *calva* (Say), 1831. In both, the posterolateral angle of the pygofer is folded inwardly to produce a pronounced marginal notch before each lateral angle.

Color and surface sculpture.—Head and pronotum back to a line between the humeral angles stramineous with raised callus appearance most pronounced between the humeri. Punctures on head prominent, fuscous rather evenly distributed, a smooth area at inner angle of each eye, reduced in size and number on tylus and toward apices of juga. Pronotum with an impressed line of fuscous punctures immediately behind the anterior margin, similar punctures tending to outline the calli and scattered transversely across the anterior lobe. Smaller fuscous punctures more numerous and scattered more uniformly over remainder of dorsal surface except pale apex of scutellum. Posterior lobe of pronotum, the scutellum and corium, stramineous to olivaceous and invaded over much of the corium by rufous. Membrane hyaline tinted with brown and underside of body pale stramineous except for black spot on each meso- and metapleuron. Scattered shallow punctures on pleurites. Evaporating area opaque. Venter of abdomen entirely smooth.

Antenna with 2 basal segments pale-green, 3rd rufescent on apical half, 4th rufescent, but pale basally; 5th rufescent except for pale basal half and extreme apex. Apex of rostrum and apical half of each claw and small dentation at posterolateral angle of each abdominal segment fuscous.

Structure.—Elongate oval. Pronotum and basal half of scutellum convex. Head with juga sinuate before the eyes and evenly

rounded to apex of tylus. Rostrum barely exceeding the hind coxae, ratio of segments as 12:22:19:16. Ratio of antennal segments as 8:13:20:26:27. Venter of abdomen with basal spine reduced to blunt tubercle and barely reaching apices of hind coxae. Male paramere as shown by fig. 6. Female genitalia as shown on fig. 8.

Length, including membrane: Male, 10.4 mm.; female, 12.0 mm.

Width across humeral angles: Male, 5.5 mm.; female, 6.1 mm.

Type material.—Holotype: ♀, Siquirres, Costa Rica, May 20, 1944, F. Schrader, No. 297; U. S. National Museum cat. no. 64404. Allotype: 1 ♂, Cayuga, Guatemala, June, 1915, Wm. Schaus. Paratypes: 1 ♂, same data; 1 ♂, same locality, Aug., Schaus and Barnes; 1 ♂, same locality, Nov., 1915, Wm. Schaus.

Note.—Ordinarily in *Banasa* males should be selected as holotypes. However, in this instance the Schrader's female specimen is so designated as a measure of insurance that their cytological data will remain associated with the name *centralis*. Although it seems unlikely, in view of the excellent diagnostic characters exhibited by the females of most species of *Banasa*, there is a possibility that the holotype is not conspecific with the female from Guatemala.

***Banasa minor*, n. sp.**

This species is smaller than *bidens schraderi* Sailer, 1957, which it in some degree resembles, though it is less punctate, more shining and lighter colored. The female genital plates are not lunately excavated at their inner apical angle and therefore the species cannot be associated with the *subrufescens* group to which *b. schraderi* belongs. Its relationship to other species of *Banasa* must await a thorough study of the genus.

Color and surface sculpture.—Head, pronotum, scutellum, and embolium pale green, remainder of corium stramineous invaded with rufous. Apex of scutellum broadly pale or stramineous. Entire dorsal surface shining. Head almost smooth, with few punctures and these not colored or but faintly tinted with rufous. Calli and margins of pronotum smooth, an impressed line of pale punctures behind anterior margin, remainder of pronotum with scattered rufescent punctures. Convex portion of scutellum similar to pronotum, punctures more crowded on apical third before the smooth pale apex. Punctures on embolium more numerous and darker than those on pronotum. Body beneath, stramineous tinted with green, shining and smooth except for scattered shallow punctures on pleurites.

Antenna green becoming fulvous on apical two-thirds of 4th and

5th segments. Legs with pale green tint similar to general body color. Apex of rostrum and apical half of claws black.

Structure.—Ovate, pronotum and basal two-thirds of scutellum convex. Margins of head sinuate before the eyes, then gradually rounded to the apex of tylus. Length of head to width across eyes as 7:9. Rostrum not exceeding apices of hind coxae, ratio of segments as 9:15:13:10. Ratio of antennal segments as 5:7:13:15:18. Venter of abdomen with ventral spine obtuse, barely reaching apices of hind coxae. Male paramere as shown by fig. 3. Female genitalia as shown by fig. 7.

Length, including membrane: Male, 7.6 mm.; female, 8.5 mm.

Width across humeral angles: Male, 4.5 mm.; female, 4.7 mm.

Type material.—Holotype: ♂, Barro Colorado Island, C. Z., Panama, May 25, 1957, F. Schrader, No. A87d; U. S. National Museum cat. no. 64407. Allotype: ♀, same data, No. A78b. Paratypes: 2 ♂ 1 ♀, same data, No. 87b, No. A87c; 1 ♂, same data, collected May 24, 1957, No. A78a; 1 ♂, 1 ♀, collected May 23, 1957, No. A68, No. A68b; 1 ♂, collected June 1, 1957, No. A127; 1 ♀, Cayuga, Guat., April, 1915, Wm. Schaus.

Banasa rufifrons, n. sp.

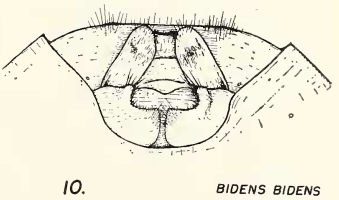
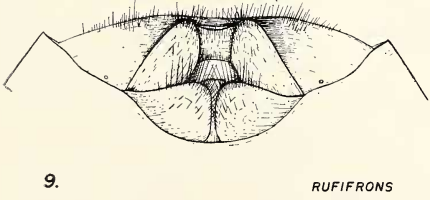
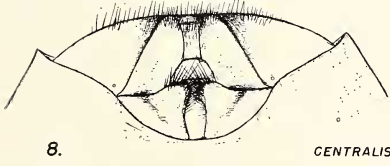
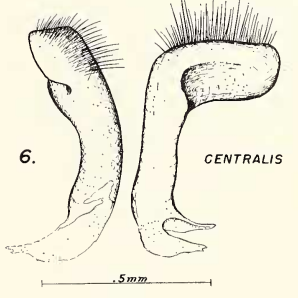
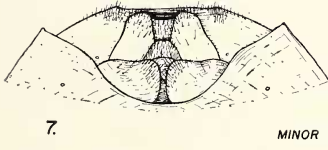
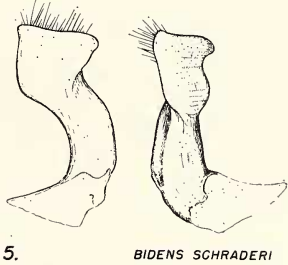
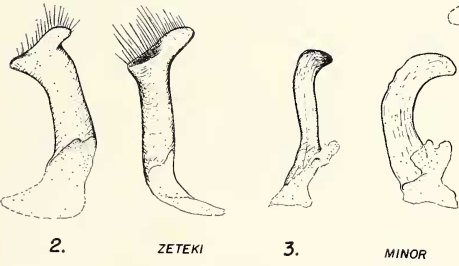
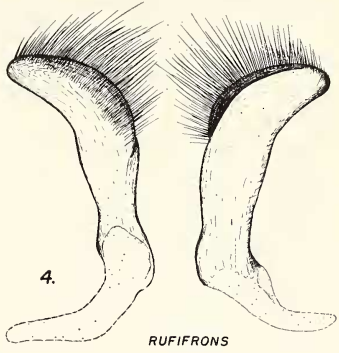
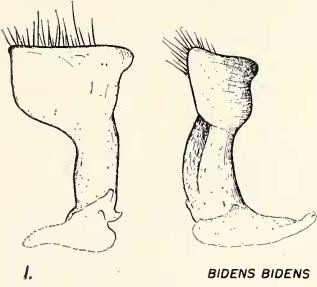
Related to *lenticularis* Uhler, 1894, being similar in size, shape and predominantly green color. The characters of the male and female genitalia also indicate close relationship. The dorsum of *rufifrons* is more punctate than that of *lenticularis* and the punctures on the head are not only more numerous but are fuscous instead of faintly if at all colored.

Color and surface sculpture.—Head stramineous, suffused with red. Anterior lobe of pronotum variegated with stramineous, calli and ivory areas interrupted with pale green and rufescent. Remainder of dorsum pale green almost hyaline. Fuscous punctures on head numerous except on occiput and areas at inner angle of each eye, forming an impressed line behind anterior margin of pronotum, absent on the calli, numerous on disk and more scattered over rest of anterior pronotal lobe. Small rufescent punctures

EXPLANATION OF PLATE

Figs. 1-6, lateral and mesal aspect of left paramere. Fig. 1, *Banasa bidens bidens*. Fig. 2, *B. zeteki*. Fig. 3, *B. minor*. Fig. 4, *B. rufifrons*. Fig. 5, *B. b. schraderi*. Fig. 6, *B. centralis*. Figs. 7-10, external female genital structures. Fig. 7, *B. minor*. Fig. 8, *B. centralis*. Fig. 9, *B. rufifrons*. Fig. 10, *B. b. bidens*.

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scattered over rest of dorsum. Membrane hyaline almost colorless. Venter luteous, a few scattered punctures on protergite and posterior margin of metatergite. Body generally shining.

Antenna with first three segments pale green, the apical halves of last two darkened. Apex of rostrum and apical half of claws fuscous.

Structure.—Elongate, oval. Dorsal surface rather uniformly convex, apical third of scutellum only moderately depressed. Head with juga sinuate before the eyes and gradually rounded to apex of tylus, length to width across eyes as 12:9.5. Rostrum barely attaining hind margins of coxae with ratio of segments as 11:20:17:13. Ratio of antennal segments as 7:11:18:21:20. Venter of abdomen with basal spine subacute, barely reaching apices of hind coxae. Male paramere as shown by fig. 4. Female genitalia as shown by fig. 9.

Length, including membrane: Male, 9.8 mm.; female, 11.1 mm.

Width across humeral angles: Male, 5.3 mm.; female, 5.9 mm.

Type material.—Holotype: ♂, Barro Colorado Island, C. Z., Panama, May 30, 1957, F. Schrader, No. A119; U. S. National Museum cat. no. 64406. Allotype: ♀, same data. Paratypes: 1 ♂, 1 ♀, May 24, 1957, No. A80 and A103, otherwise same data. 1 ♂, same locality, May 13, 1937, S. W. Frost.

LITERATURE CITED

- Sailer, R. I. 1957. Two new species of *Banasa* from Central America (Hemiptera: Pentatomidae). *Bul. Brooklyn Ent. Soc.* 52 (4): 85-88.
- Schrader, F. and Hughes-Schrader, S. 1958. Chromatid autonomy in *Banasa* (Hemiptera: Pentatomidae). *Chromosoma* 9 (3): 193-215.

Five Monellia Aphids in Utah: From my 1957 collecting, Hille Ris Lambers identified the following species of *Monellia* aphids from Utah: *M. californica* Essig, alates on walnut at Provo, September 27; *M. caryae* on *Juglans nigra*, September 27 at Geneva and Payson; *M. caryella* (Fitch) May 7, and *M. costalis* (Fitch) June 13 and September 24, on pecan foliage at St. George; and *M. nigropunctata* Granvosky on *Juglans nigra* at Geneva and Payson on September 27.—GEORGE F. KNOWLTON, Logan, Utah.